

### **REMARKS**

Reconsideration of the application is respectfully requested.

#### **I. Status of the Claims**

Claims 1, 3 - 5 and 7 – 9 are presently pending, with claims 2 and 6 having previously been canceled without prejudice or disclaimer. Applicants cancel claims 1, 4 and 9 without prejudice or disclaimer, and amend claims 3 and 5. No new matter is introduced.

#### **II. Examiner Interview**

Applicants thank Examiner Weinstein and Examiner Kramer for participating in a telephonic interview with Applicants' representative on November 20, 2008. During this interview, Applicants' representative presented amendments to independent claims 1 and 5, arguments to distinguish Applicants' invention as claimed in claims 1, 3 and 5 over the Examiner's cited reference, as further described herein. Applicants' thank the Examiner for indicating that amended independent claim 5 distinguished over the cited reference, and for suggesting amendments to claim 3 that would distinguish over the reference as well. Applicants amend claim 3 accordingly. Examiner Weinstein did not find that amended claim 1 distinguished over the cited reference. While Applicants are not in agreement with this position, they nevertheless cancel claim 1 without prejudice or disclaimer in the interests of efficiently moving the application on to allowance.

### III. Claim Rejections under 35 U.S.C. § 102

Claims 1, 3 – 5 and 7 – 9 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,629,561 to Shirato et al. (“Shirato”).

In the interests of prosecution efficiency, Applicants cancel claims 1 and 4 without prejudice or disclaimer. Applicants also cancel claim 9 without prejudice or disclaimer, amend claim 3 to incorporate the limitations of canceled claim 9, and amend claim 5. As claims 1, 4 and 9 have been canceled without prejudice or disclaimer, the rejections as to claims 1, 4 and 9 are moot. Applicants respectfully traverse the rejection of claims 3, 5, 7 and 8 under 35 U.S.C. § 102(b).

In independent claim 5, Applicants claim:

**5.** A vacuum degassing apparatus for removing dissolved gas from liquid, comprising:

a vacuum vessel including a gas permeation diaphragm;

an exhaust vacuum pump; and

a vacuum control system, the vacuum control system including:

a controller for monitoring the inside pressure of the vacuum vessel using a pressure sensor, and controlling a voltage applied to a DC brushless motor on the basis of an output signal resulting from measurement of the inside pressure of the vacuum vessel by the pressure sensor to control the displacement of the exhaust vacuum pump; and

an air introduction device inserted in a vacuum exhaust path connecting the vacuum vessel to the exhaust vacuum pump for continuously introducing a controlled amount of air externally supplied into the vacuum exhaust path, wherein

gas dissolved in the liquid is isolated with the gas permeation diaphragm by reducing the inside pressure of the vacuum vessel by operating the exhaust

vacuum pump, and by operating the controller to hold the degree of vacuum in the vacuum vessel constant.

(Emphasis added).

Shirato discloses a liquid chromatograph including a solvent tank, a pump, a sample injection element, a column, a detector, conduits for successively interconnecting these elements, and a flow controller which is connected between the pump and the detector and in parallel with the column (see, e.g. abstract of Shirato). With reference to FIGs. 1 and 2 of Shirato and Applicants' independent claims 1 and 5, the Examiner compares a flow controller 8 of Shirato to Applicants' claimed controller, a detector 5 of Shirato to Applicants' claimed vacuum vessel, a compression spring 20 of Shirato to Applicants' claimed pressure sensor, a pump 2 of Shirato to Applicants' claimed vacuum pump, a pipe (c) to Applicants' claimed exhaust path, and a unit 9 of Shirato to Applicants' claimed air introduction device.

**FIG. 1**

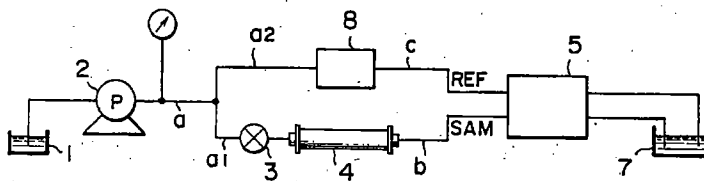
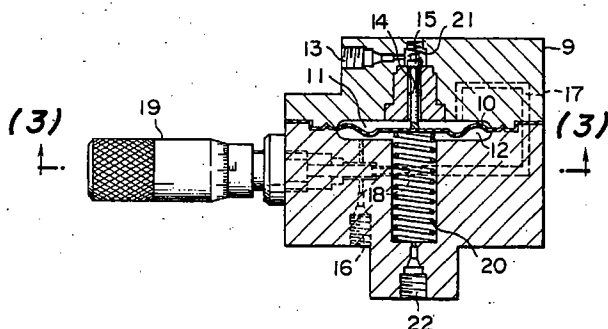


FIG. 2



In sharp contrast to Applicants' claimed vacuum control system, Shirato does not disclose that the detector 5 is a vacuum vessel including a gas permeation diaphragm. As the pump 2 of Shirato exhausts fluid from the solvent tank 1 and pumps this fluid under a positive pressure through the exhaust pipes a, a1, a2 to the detector 5, there is no indication that the detector 5 operates under a vacuum or that the pump 2 acts as a vacuum exhaust pump (see, e.g., Col. 3: 1 – 17 of Shirato). In addition, Shirato provides no positive recitation as to inclusion of a gas permeation diaphragm in the detector 5.

The Examiner argues that the fluid circulated through the flow controller 8 inherently includes a dissolved gas like air, and that the flow controller 8 controls the flow of the fluid (including the air) into the detector 5. It should be noted that that Shirato does not explicitly teach the presence of a dissolved gas in either of the solvent fluid or sample. Moreover, and in sharp contrast to Applicants' claimed device, the flow controller 8 does not provide such control by continuously introducing a controlled amount of externally supplied air into the fluid path.

Arguably, any gas that is present in the fluid is introduced into the solvent fluid upstream from the flow controller 8, rather than externally at the flow controller 8. Flow controller 8

controls a flow rate of the solvent fluid out of the flow controller 8, and exhibits no means for controlling the introduction of an air stream into the flow path at or by the flow controller 8. Moreover, and in sharp contrast to Applicants' claimed invention, the flow control function of Shirato's liquid chromatograph is entirely performed within the flow controller 8, and the flow controller 8 does not operate to control a voltage applied to a DC brushless motor on the basis of an output signal resulting from measurement of the inside pressure of the vacuum vessel.

For at least the above-argued reasons, Applicants submit that amended independent claim 5 is not anticipated by Shirato, and stands in condition for allowance. As claim 7 depends from allowable claim 5, Applicants further submit that dependent claim 7 is also allowable for at least this reason.

In independent claim 3, Applicants claim:

**3. A constant circulation resistance tube comprising:**

a resistance adjusting rod coaxially inserted into a hollow capillary, said constant circulation resistance tube being configured for controlling a flow rate of gas circulating between an inner circumference of the hollow capillary and an outer circumference of the resistance adjusting rod by varying an insertion length of the resistance adjusting rod inserted into the hollow capillary in order to adjust a circulation resistance of the gas;

a separation preventing short tube configured for fitting to an outer circumference of the hollow capillary at an opening end in order to fix the insertion length of the resistance adjusting rod in the hollow capillary; and

a waste inflow preventing filter fitted to an opening of the separation preventing short tube for preventing waste materials from being introduced into the circulating gas.

(Emphasis added).

With reference to claim 3, the Examiner compares a passage 14 in the controller 8 of Shirato to Applicants' claimed constant circulation resistance tube and to Applicants' claimed

capillary, an adjustment rod 15 in the controller 8 to Applicants' claimed resistance adjusting rod, and a compression spring 21 in the controller 8 to Applicants' claimed pressure separation preventing short tube. However, and in sharp contrast to Applicants' device as claimed, if it can be said that the passage 14 of Shirato defines an inner circumference of a capillary of the claimed resistance tube, compression spring 21 cannot be said to be fitted to an outer circumference of the passage 14. Moreover, compression spring 21 is not a tube.<sup>1</sup>

The Examiner suggested during the interview of November 20 that a "washer 15" positioned above the compression spring 21 in the controller 8 of Shirato may alternatively be considered to function in the manner of Applicants claimed short tube. Applicants respectfully disagree.

Shirato describes an "adjustment valve (15) [[ ]] provided to adjust the flow rate of the solvent entering from the solvent inlet (13), one end of the valve being connected to the diaphragm (10) to operate together with the diaphragm (10) and the other end being compressed by the spring (21) in order not to operate inadvertently" (see, e.g., Col. 2: 43 – 49 of Shirato). There is no evidence provided by Shirato to suggest that the adjustment valve 15 includes a washer positioned above the spring 21. Even assuming *arguendo* that the washer exists, and that it is aptly compared to Applicants' claimed short tube, the washer in sharp contrast to Applicants' claimed short tube does not operate to fix the insertion length of the adjustment rod 15 of Shirato in the passage 14, as the adjustment rod 15 must continue to move with respect to the passage 14 in order to operate the diaphragm 10.

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<sup>1</sup> A tube can be defined as "conduit consisting of a long hollow object (usually cylindrical) used to hold and conduct objects or liquids or gases (see, e.g. [wordnet.princeton.edu/perl/webwn](http://wordnet.princeton.edu/perl/webwn)).

Moreover, and as acknowledged by the Examiner, Shirato fails to teach Applicants' claimed waste inflow preventing filter fitted to an opening of the short tube.

For at least the above-argued reasons, Applicants submit that amended independent claim 3 is not anticipated by Shirato, and stands in condition for allowance. As claim 8 depends from allowable independent claim 3, Applicants submit that dependent claim 8 is also allowable for at least this reason.

Therefore, Applicants respectfully request that the rejections of claims 3, 5, 7 and 8 under 35 U.S.C. § 102(b) be withdrawn.

### **CONCLUSION**

In view of the above amendments and remarks, Applicant believes the pending application is in condition for allowance. If there are any remaining issues which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

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Respectfully submitted,

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